On the Characteristics of the External Cathode Counter

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To ascertain that these peaks are not due to statistical fluctuations, we divided the total data in half in an arbitrary way and examined the pulse height distributions.

In each half, we could find the peaks at the same positions as in Fig.2. Thus, though the number of registered pulses is not yet sufficiently large, we can attribute these peaks to the resonanses in the reactions of O^{16} with tolerable reliance.

At the present stage, we can not conclude about the type of reactions and the energy levels of the compound nucleus O^{17} or the residual nuclei to which these peaks belong. To clarify these points, further experiments are now being continued by using (Be+D) neutrons and varying the chamber pressure.

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5. On the Characteristics of the External Cathode Counter

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An external cathode counter is very simple in its construction and convenient for use as compared with an ordinary G.M. counter. It was described by a few workers, but its characteristics were not shown. We, therefore, studied such a counter and obtained satisfactory results.

The counter used is shown in Fig.1. The envelope is of an ordinary soda-glass

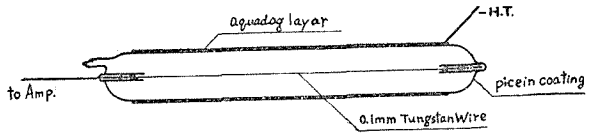

Fig. 1. O. dia. 20 mm., length 135 mm.

and 1 mm. in thickness. A thin layer of aquadag is coated on its outer surface

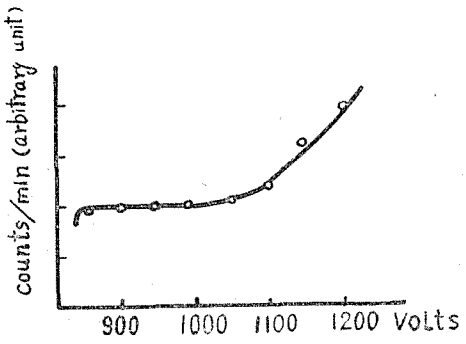

Fig. 2.

and used as a cathode. It is filled with 1 cm. Hg Alcohol vapor and 10 cm. Hg of Ar gas (several per cent nitrogen gas is contained as impurity). Several characteristics of this counter are shown in Fig.2, which show the plateau of about 200 volts with a slope of less than 10 %. This slope will become smaller, if purified Ar gas is used.

It is feared that the characteristics become worse on account of accumulation of surface charge at a large counting rate or after use for a long time because of the non-conductivity of gas. As shown in Fig.3, the properties of the counter remain unchanged in such cases.

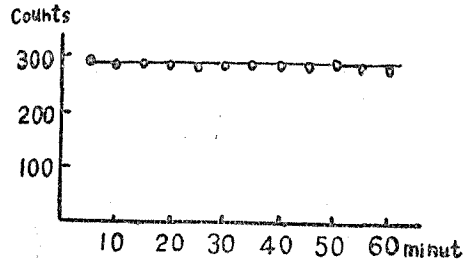

Fig.3

The photosensitivity was investigated, but such an effect was not found.

Next, we tried to use it as a dipping counter. It has no layer of aquadag. The active solution in which the counter is dipped acts as a cathode. The wall-thickness and filling gas are the same as before. The characteristics obtained are similar as shown in Fig. 2.

A small probe counter also investigated. A very long plateau (about 600 volts) is found in this case. It, however, is not yet obviously explained.

The precise investigations of these counters are now in progress.

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6. Radioactive Determination of Potassium in Plant Ashes

(Preliminary Report)

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As an analytical method for determining potassium content in plant ashes (A. M.Gaudin *et al.*, *Ind. Eng. Chem., Anal.Ed.*, **20**, 1154 (1948)), we measured the natural radioactivity of K^{40} in them with an end-window type G-M counter, whose thickness of a mica window was 2.9 mg./cm^2. and its area 3.14 cm^2.